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**Neural stem cells improve intracranial nanoparticle retention and tumor-selective distribution.**

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**Public Summary:**

AIM: The purpose of this work is to determine if tumor-tropic neural stem cells (NSCs) can improve the tumor-selective distribution and retention of nanoparticles (NPs) within invasive brain tumors. MATERIALS & METHODS: Streptavidin-conjugated, polystyrene NPs are surface-coupled to biotinylated human NSCs. These NPs are large (798 nm), yet when conjugated to tropic cells, they are too large to passively diffuse through brain tissue or cross the blood-tumor barrier. NP distribution and retention was quantified 4 days after injections located either adjacent to an intracerebral glioma, in the contralateral hemisphere, or intravenously. RESULTS & CONCLUSION: In all three in vivo injection paradigms, NSC-coupled NPs exhibited significantly improved tumor-selective distribution and retention over free-NP suspensions. These results provide proof-of-principle that NSCs can facilitate the tumor-selective distribution of NPs, a platform useful for improving intracranial drug delivery.

**Scientific Abstract:**

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